



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/713,215	11/16/2000	YASUNAGA KAYAMA	107314	2926
25944	7590	12/03/2003	EXAMINER	
OLIFF & BERRIDGE, PLC			KIM, PETER B	
P.O. BOX 19928				
ALEXANDRIA, VA 22320			ART UNIT	PAPER NUMBER

2851

DATE MAILED: 12/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/713,215

Applicant(s)

KAYAMA, YASUNAGA

Examiner

Peter B. Kim

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-11, 14-24, 26, 28-36, 38 and 40-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-11, 14, 15, 18-24, 26, 28, 30-36, 38, 40, 42-46 and 48-52 is/are rejected.
- 7) ☒ Claim(s) 16, 17, 29, 41, 47 and 53 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 102003.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicant's arguments filed on Oct. 24, 2003 have been fully considered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-8, 9-11, 14, 15, 18-24, 26, 28, 30-36, 38, 40, 45, 46, and 48-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al. (Akimoto) (6,359,688) in view of Hayashi (6,036,162) and Takahashi et al. (Takahashi) (6,008,885).

Akimoto discloses an exposure apparatus and a method of making an exposure apparatus and a method of exposing a pattern of a reticle (7) onto a substrate or an object (W), with a projection system (PO), a holder (not shown) to hold the projection system, acceleration detector (16Uy, 16Dy) located on the projection system to detect information concerning displacement of the projection system, an actuator (34), a driver connected to the actuator to drive the actuator in response to detection results of the detector (Fig. 2). Akimoto also discloses actuator including piezoelectric elements (col. 12, lines 13-16), a mask stage (8, 9) for holding and moving the mask, and a substrate stage or an object stage (12, 15) for moving and holding the substrate or the object. Akimoto discloses a driver (31, 33) connected to the actuator to drive the actuator (Fig. 2). However, Akimoto does not disclose the actuator arranged on the holder for holding the projection system arranged on a relatively weak part of the holder. Akimoto also does not

disclose the actuator mounted on an adapter plate that is releasable, a supporting member that supports the projection system and a damper which isolates the projection system from one of the substrate and the reticle stage. Akimoto does not disclose a distortion sensor.

Hayashi discloses in Figure 7, an exposure apparatus and method where the actuators (235) are located in the holder (224) and the acceleration detectors (232) are located on the holder. Hayashi also discloses the support member (Fig. 7, column or legs supporting the holder 224), which supports the projection optical system, but does not support the substrate stage (220). Hayashi discloses the actuator mounted on an adapter plate (231), which is releasable and located at a relatively weak part of the holder (Fig 7, 231C). Hayashi also discloses a detector which is a distortion sensor (col. 20, lines 36-45). Takahashi discloses in Fig. 1, an exposure apparatus with a support member supporting the projection system (2), which does not support the substrate stage, and a damper (11) that isolates the projection system from the stage (6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the actuators on the holder and the acceleration detectors on the holder as in Hayashi and the damper which isolates the supporting member from the substrate stage as in Takahashi in order to reduce deformation of the apparatus and effectively suppress the vibration with high degree of accuracy as taught by col. 4, lines 52-64 and to reduce the effect of displacement of the stage on the scanning operation as taught by Takahashi in col. 1, lines 39-60.

2. Claims 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akimoto et al. (Akimoto) in view of Hayashi and Takahashi as applied to claims 1, 18 and 30 above, and further in view of Watson (5,959,427).

The further difference between modified Akimoto and the claimed invention is the exposure apparatus comprising a compensatory driving system that applied compensatory force to the stationary part of the object stage drive system. Watson discloses in Figure 3, an object stage drive system that includes movable part and stationary part and a compensatory driving system applies force to stationary part of the stage drive system and a compensatory driving system (60, 62) that applied force to the stationary part. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a compensatory driving system to the invention of Akimoto in order to ensure that there is no uncanceled reaction moment and no disturbance of the base stability (the abstract of Watson).

Allowable Subject Matter

Claims 16, 17, 29, 41, 47 and 53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

In response to the amendments to the claims, Takahashi reference is used in the rejections. Takahashi teaches a damper which isolates the projection system from the stage.

Regarding the support member, which supports the projection system by the holder, the reference 224 of Hayashi is interpreted as the holder in the claimed invention and the legs of the holder 224 (unnumbered) are interpreted as the supporting member.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams, can be reached on (703) 308-2847. Any inquiry of a general nature or

Application/Control Number: 09/713,215

Page 6

Art Unit: 2851

relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

A handwritten signature in dark ink, appearing to read 'Peter B. Kim', with a stylized flourish at the end.

Peter B. Kim

Patent Examiner

November 21, 2003